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Concerning Thunderbolts

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## CONCERNING THUNDERBOLTS.

BY H. BALFOUR, M.A., F.R.S.

*(Read at Meeting, 20th March, 1929.)*

I SHOULD, perhaps, preface my discourse upon "Thunderbolts" by making the admission that such things are actually non-existent. "Thunderbolts" are, in fact, fictitious products of imaginations as vivid as the lightning-flashes which are popularly and widely believed to indicate the earthward track of these assumed celestial projectiles. But, in spite of the purely mythical status of these bodies, the popular acceptance of certain objects as "thunderbolts" is very real, and the objects themselves are concrete actualities, far more substantial than are the interpretations of their nature. Hence, we are dealing with actual objects and with beliefs concerning them which are also very definite, which gives the folklorist ample grounds for regarding "thunderbolts" as phenomena worthy of study as such.

Their supposed existence is based upon the erroneous belief that, accompanying a lightning-flash and following, or, perhaps, causing its track, solid objects, intensely hot, are precipitated from the sky and become buried in the earth, whence they have sometimes been retrieved.

The fact that, where lightning strikes the ground, a hole is sometimes formed, the mineral lining of which is often vitrified by the heat, may, as has been suggested, have been a factor in generating this belief in the descent of solid objects during thunderstorms. Moreover, aeroliths (or meteoric stones), which have been seen to fall, have from

time to time been dug up, still hot from the friction due to rapid passage through the atmosphere. These have, no doubt, by a confusion of issues, contributed to the theory of thunderbolts as solid missives from the clouds. Once this idea of the descent of tangible bodies, as solid precipitates accompanying flashes of lightning, had taken root, a large number of otherwise inexplicable phenomena found a ready and acceptable interpretation. Stones of peculiar form were constantly turning up in the soil, serving to mystify those who had no means of diagnosing them scientifically. To account for some of the strange and striking shapes, it was assumed that these objects must be material products of thunderstorms, the missile weapons of angry gods, and so on, and, for the time being,—the time having in many areas lasted until the present day,—the “thunderbolt” became, in popular belief, an unquestioned entity. A variety of natural objects has been credited with supernatural origin. As is well known, fossil echinoids (or sea-urchins), when not regarded as “fairy loaves,” are in many parts of Europe looked upon as thunderbolts. Similarly, the very common fossils known as belemnites are widely considered to be “darts from Heaven,” “thunderbolts,” or “*clous de tonnerre*,” and are believed to have descended from the sky during thunderstorms. To the cold unemotional eye of the scientist, these are merely the silicified tests of extinct echinoderms, on the one hand, and the fossilized calcareous endo-skeletal rods of extinct cephalopodous, dibranchiate molluscs, on the other. Scientific research arrives at accuracy at the expense of romance!

But, in spite of the spread of scientific doctrines, the more romantic interpretations afforded by popular philosophy still persist, and one of my objects in referring to the beliefs attaching to these well-known fossils, is to place on record the fact that in the immediate neighbourhood of Oxford,—reputed a great educational centre,—the belief is still prevalent that belemnites are the material products of

thunderstorms, and that their extra-telluric origin endows them with potent virtues and mystic qualities.

A few years ago, I learned of several instances of belemnites having been preserved in cottages in Oxfordshire, where powder scraped from them is administered in water to children suffering from an eruptive disease of the lips, popularly known as "white mouth," which is believed to be curable by the "thunderbolt medicine." Such late survivals are interesting as showing how long-established traditions die hard, blindly ignoring the "last ditch" dug for them by modern science, and so maintaining a continued, though increasingly precarious, existence, in the face of facts which, if swallowed, would ensure their quietus. The possibility that the powdered lime may promote some mechanical curative effect is beside the point, since it is the supposed celestial origin of belemnites which endows them in the popular mind with a medicinal value, and not the fact of their being composed of calcareous matter.

Cold-blooded science has explained away the "thunderbolt" myth, and has theoretically removed its concrete products from the sphere of the folklorist. But the latter's business is to collect and investigate dead, moribund, and out-of-date beliefs, and to preserve their memory.

Owing to the extremely wide distribution of beliefs in "thunderbolts," material may be culled from most parts of the world. Almost everywhere one finds that natural stones of peculiar form are liable to be regarded as such; while the artefacts of the Stone Age are similarly diagnosed in nearly all regions where knowledge or tradition of a former Stone Age culture-phase has been lost. Among peoples whose culture stagnated and never advanced beyond the Stone Age status, we naturally find but little trace of this belief in the mystic origin of stone-implements. Such peoples are the Tasmanians, Australians, Melanesians, Polynesians, and most of the primitive inhabitants of the New World.

It is not my purpose to treat of the folklore of "thunder-

bolts " in general. This is unnecessary, since a very extensive literature has already grown up around this interesting subject, admirably detailing and analysing the belief in its various manifestations. I must confine myself to a limited field of operations, and select my topics from within the wider field.

One point of interest in connection with the subject is the relationship of the " thunderbolt " myth to the study of Prehistory. To the prehistorian " thunderbolts " are a matter of concern, inasmuch as they have played a part,—as a retarding agency it is true,—in the developmental progress of his science. A brief summary of the early chapters in the story of the graduation of Prehistory as a science will make this clear.

In most parts of the world where culture had reached the developed Age of Metal, there is discernible a period of hiatus between the actual Age of Stone and the far later recognition or rediscovery of its former existence ; a period during which the knowledge had died out of an early culture-phase throughout which stone was the material used for making tools and weapons, and even the traditions of such a phase had largely been forgotten. The implements and weapons of the Stone Age nevertheless constantly obtruded themselves, excited interest, and invited speculation as to their nature, origin, and *raison d'être*, which called for explanation. Since the genesis of the objects in question could not be attributed to human agency, although their resemblance to axe-heads, arrow-heads, knives, etc. was generally recognized and admitted, the mystery of their origin was solved by assigning them to super-human or super-natural sources. The belief in certain natural objects (fossils and other striking forms) being thunderbolts was probably already time-honoured, and it is natural that this interpretation should have become applied to the mysterious stone objects which we now recognize as the artefacts of vanished cultures. The very ready and widespread

acceptance of the celestial derivation of stone celts and arrow-heads, and the fact that this diagnosis continued until recent times to satisfy even highly educated people, is symptomatic of the fact that Prehistoric Archæology is one of the youngest of the sciences. The infancy and early struggles of the science of Prehistory are deeply involved in the "thunderbolt" myth, since it was precisely these so-called "thunderbolts" which the nascent science was called upon to diagnose. The progress of the new science was materially retarded by the antagonism of traditional old-established views as to the nature of the objects under consideration. At a later stage further opposition was aroused from another direction. Not only did the promoters of the theory of the human origin of these stone objects tread upon the toes of the keraunophils, the supporters of the "thunderbolt" theory; but, by their assignment of the relics of the early Stone Age to a very high antiquity on geological and palæontological evidence, they hit hard the orthodox theologians of the day, who could only allow a period of some 6000 years for the whole story of development,—a mere trifling fraction of the time demanded by science to explain the phenomena of human progress.

If one recalls chronologically some of the views successively held during the embryological stages in the evolution of the study of Prehistory, one can trace the gradual emergence of the modern views from the older stage by stage.

Paracelsus [early sixteenth century], while recognizing the artefact appearance of stone celts, regarded them as having been made by God. In the second half of the sixteenth century there were included among the collections in the Vatican several objects which were described as "thunderbolts" ("*folgori*," or "*pietre di fulmine*"). This description appears to have been satisfactory until Michel Mercatus, physician to Pope Clement VIIIth, expressed his doubts as to the accuracy of the diagnosis, and urged that the so-called "thunderbolts" were nothing else than the weapons of a

people who were not yet acquainted with metals. Other instances could be quoted of the recognition, more or less tentative, of the artificiality of the celts and other objects of Neolithic culture by the more enlightened and unprejudiced observers. But the general adherence to the older belief steadily persisted, and such objects continued to be regarded as either freaks of nature or as of extra-telluric *provenance*. The "thunderbolt" theory still remained dominant. During the seventeenth century we see even scientists of the day adhering to the old view. Dr. Lister insisted upon the natural genesis of Neolithic stone implements, and Aldrovandus, Gesner, Boethius, and others were maintaining their keraunic origin.

There is something almost pathetic in the longing expressed by Olaus Wormius (1655) to be able to ascribe to human agency certain beautiful Danish flint blades. His temptation to diagnose these as the handiwork of Man was neutralized by his belief that it was impossible to fashion flint in this manner. He says :—" *Si silex ullo modo foret tractabilis, potius Arte quam Naturâ elaboratum esse hoc corpus jures.*" A little later he makes reference to flint daggers,—"*de quibus dubito Artisne aut Naturae sint opera. Ad ceraunias sunt qui referunt; sunt qui veterum gladiolos fuisse arbitrentur.*" The struggle is acute at this stage, but a growing tendency to ascribe to Man the actual objects of his handiwork is apparent.

William Dugdale, in 1656, definitely regarded Neolithic celts as having been made by Man during a pre-metallic culture-phase.

Early in the eighteenth century, Bernard de Jussieu (1723) introduced ethnological evidence to bear upon the problem. He compared the so-called "thunderbolts" of Europe to certain recent stone implements from South America, and urged that the former were the tools of an early and extinct culture. He assumed for these artefacts a considerable antiquity, but this does not appear to have aroused much

controversy. In connection with the interpretation of objects of the late Stone Age, little opposition appears to have arisen to suggestions of a high, though undefined, antiquity for these stone implements; the struggle was in the main one between Nature, or Super-nature, and Man as the creator of these objects.

But a battle royal arose when the culture relics of the *older* Stone Age came to be investigated seriously, and an exceedingly high antiquity began to be assigned to them.

The famous palæolith (of Chellean type) found together with the tooth of an elephant near Gray's Inn Lane in 1690 appears to be the first implement of the early Stone Age to have been collected and preserved. It is interesting to note that it was accepted without demur as artefact, and was described as a British weapon. Its Quaternary association did not excite special remark.

A century later, in 1797, John Frere discovered several fine early-Palæolithic implements in stratified alluvial deposits at Hoxne, and from their geological position and associations he was driven to assign them to an extremely ancient date. A high antiquity was demanded also to explain the *gisement* of the objects discovered in 1825 by the Rev. John MacEnery in Kent's Cavern, Torquay, while Tournal made a similar claim for implements found by him in the Grotte de Bize in 1828, where the associated fauna was of Quaternary type. Again, Dr. Schmerling's discoveries at Liège indicated great antiquity for implements of early-Palæolithic type discovered by him.

Controversy began to reach an acute stage; it was recognized that the tenets of orthodox belief were endangered by the new-fangled heresies. Scientific proof had to battle with hide-bound prejudice, and the struggle now was one between science and the Church. The critical phase of the controversy was reached in 1846, when Jacques Boucher de Perthes published the results of his researches in the alluvial terrace deposits in the valley of the Somme. The



geological and palæontological data, which he adduced in proof of the extreme age of the associated implements, only served to intensify the indignation of the orthodox, and to cause torrents of abuse of the man who had worked in accordance with the scientific method. Even the great naturalist Cuvier refused to be convinced by geologic evidence of the most conclusive kind. In spite of the vigorous and bitter opposition which he had aroused, Boucher de Perthes went on with his researches, and was insistent as to the validity of his deductions. His conscientious steadfastness, and the mass of evidence with which he supported his argument, aroused the interest of men of science in England, and Prestwich, John Evans, Lyell, Hugh Falconer, and others co-operated with de Quatrefages in France and visited the scene of operations, with a view to forming their own conclusions and evaluating de Perthes' conclusions. One and all, they returned completely convinced by the evidence. Prehistoric archæology entered upon its final developmental phase, and henceforward was but little embarrassed by the old traditional arguments.

But, in my desire to complete this very brief revue of the early progress of Prehistory, I have been led away from "thunderbolts," since the later stages of the controversy took a new turn, when the relics of the *earlier* phases of the Stone Age were under consideration. The Palæolithic implements had at first been accepted without demur as the work of man, and, so long as their immense antiquity was not too urgently insisted upon, they continued to be so accepted. But, when the question of their age was definitely mooted, it was urged in opposition that, if they were as old as all that, they were not Man's handiwork at all, but must be either natural formations or, presumably, of celestial origin. The primitive ingenuousness of this line of argument leads me to plead that, although I have been to some extent led away from the main theme of my paper, I have none the less continued to operate within the province of Folklore.

Let me return to the more direct consideration of thunderbolts. One of the most interesting uses to which objects popularly believed to be "thunderbolts" are put is the one which causes them to function as a protection against the very force which is believed to have generated them. The belief is very widely held that lightning never strikes the same spot twice,—a belief which is well founded, since it is very unlikely that the same spot would be the victim of such a visitation more than once. A natural corollary to this belief was that the possessor of a "thunderbolt" could render himself or his property immune to attack by lightning. This inference led to the practice of taking fossil echinoids, belemnites, pieces of iron pyrites, Neolithic celts, and other objects which were regarded as having descended with lightning flashes, and of placing them in houses, building them into the walls or imbedding them under the hearthstones, in the full assurance that this inoculation of the building with a *spent* thunderbolt would render it immune to a more direct attack. This prophylactic use of "thunderbolts" against lightning is met with in so many regions, that we must assume that it originated at an early date; how early it is not possible to say. It has been recorded from the Shetland Islands, the Channel Islands, France, Belgium, Germany, Italy, Switzerland, Austria, Hungary, Lithuania, Denmark, Sweden, and Russia; also from Asia Minor, Darjiling, among the Santals, from West Africa, and from the Antilles. No doubt its range is even greater still.

This theory of the value of spent thunderbolts in immunizing persons and property to attack by lightning, being a product of primitive reasoning, acquires a special interest and significance when we reflect that a precisely similar line of reasoning, owing its inception to a popular tradition, though in this case substantially founded upon scientific experiment, led to Edward Jenner's epoch-making discovery in 1790, that people could be rendered immune to smallpox

by the process of inoculation with an attenuated form of a closely related disease. The analogy is striking, and the principles involved in the prophylactic use of the spent thunderbolt, on the one hand, and of the serum, or vaccine, on the other, are essentially identical.

In the employment of "thunderbolts" for the protection of buildings, a mimetic procedure is occasionally followed. It has been the practice in certain regions (in Scandinavia and Germany) to hurl the "thunderbolt" against the building to be protected, against the door, or on to the roof, thus imitating the striking of the house by the lightning missile, and so increasing the chances of immunity.

In certain districts in Denmark, Germany, and Lithuania it has been customary to place "thunderstones" (fossil sea-urchins, Neolithic celts, etc.) in the dairy, on the milk-shelves or in the milk itself, with the object of preserving milk and cream from turning sour. In thundery weather, as is well known, milk is liable to be turned sour very rapidly, and this employment of the "thunderstones" prophylactically suggests that here again the principles of inoculation are observed, and that contact with a spent thunderbolt is believed to avert the influence of thunder or lightning in a more active form.

I recently learned of a very interesting instance of a "thunderbolt" (a ground stone celt) being regarded as still dangerous and capable of causing disaster, instead of averting it. Mr. C. R. Pawsey last year sent to Dr. J. H. Hutton a celt which had been found by an Ao Naga of Sangratsü, in the Naga Hills, and had been kept by him as a "thunderbolt," presumably for luck. It appears that during the first year of possession the owner's field-house was blown down, and in 1928 his house was struck by lightning. The aggressive activity of the "thunderbolt" was considered to be due to a curious reddish streak which runs across this particular celt, and which was regarded as indicating the lightning

itself. This "thunderbolt" was in fact a "live" and not a "spent" one, and still retained its destructive power. Mr. Pawsey ended his letter to Dr. Hutton as follows:—"You had better dispose of the celt quickly, unless you want a new bungalow!" Dr. Hutton promptly passed it on to me for the Pitt Rivers Museum, where it now rests,—more or less, that is to say, for it must be admitted that during the November gale of last year (1928) a large portion of the museum roof was blown off!

Another widespread belief attaching to "thunderbolts" is that the impetus of their descent from the sky causes them to be driven deep into the ground, and that after a period they rise again to the surface. In order to secure the "thunderbolt" it is necessary to mark the exact spot where the lightning struck, and then to wait until the period (which varies in the different regions) has lapsed, when the "bolt" will reappear above ground. I have references to the existence of this belief in France, Italy, Germany, Alsace, Austria, Hungary, Moravia, Lithuania, Russia, and Sweden; and the same applies to Ashanti, the West Indian negroes, the Azores, Burma (where it also applies to bronze spearheads and celts), China, the Naga Hills (Ao and Angami tribes), and Siberia.

Again, the employment of "thunderbolts" as a means of curing or averting sickness is very widely diffused. In some instances personal contact with the "thunderbolt" achieves the desired end; in others, the "thunderbolt" is placed in water which is to be drunk by sick persons or sick cattle. Or again, powder may be scraped or rubbed from the surface of the "thunderbolt" and administered to the patient. In any case the mystic healing potency of the ceramnic object is transmitted to the patient, with an effect which probably varies with the intensity of the belief in its efficacy. I have already cited a specific instance of this therapeutic quality of "thunderbolts," when I referred to the medicinal use of belemnites in Oxfordshire; but this

traditional belief is widespread in the British Islands. It has been noted in England, Scotland, and Ireland. It has also been reported from France, Germany, Austria, Moravia, Poland, Lithuania, Russia, Holland, and Lapland. Extra-European instances are recorded from Asia Minor, North and Central India, the Naga Hills, Burma, Amboyna, China, Siberia, West Africa, and the West Indies.

The geographical range of these beliefs could without doubt be proved to be even more extended, but, without my stressing details, it is evident that identical interpretations of the qualities and potentialities of "thunderbolts" are diffused over exceedingly wide areas, and that there is marked coincidence in the dispersal of the several beliefs, which suggests that it is likely that they had their origin in some one centre and gradually spread by culture-diffusion. The alternative theory of an independent origin in two or more centres will hardly suffice to account for so many close correspondences.

I will give one further instance of faith in the mysterious potency of a "thunderbolt." In the Naga Hills there is a stone celt which I have long coveted, since it is of an interesting type. It was mentioned to me by Dr. J. H. Hutton, who, in spite of several attempts, has failed to acquire it from its owner, an elderly Naga of intemperate habits, who sets great store upon the celt. On the day following an orgy of drinking, he sits licking his "thunderbolt" in full reliance upon its peculiar efficiency for cooling his burning tongue. He will not sell it, nor will he exchange it for a demonstrably superior substitute; and it seems likely that I must be content to wait until the old man either dies, loses his faith in "thunderbolts," or takes the pledge, when, possibly, the celt may become available for museum purposes. Meanwhile I bear him no grudge, since he has furnished another example of belief in the value of contact with a supposed "thunderbolt," as a means of alleviating discomfort.

With this instance I will conclude this brief sketch of some of the beliefs relating to "thunderbolts." To do justice to the subject would demand publication in a large and extensively illustrated volume. Pending the appearance of such an exhaustive monograph, I would recommend those seeking further and more detailed information to refer to the following works :—

C. Blinkenberg, *The Thunder Weapon in Religion and Folklore*, (1911).

Sir J. Evans, *Ancient Stone Implements of Great Britain*, (1897), ch. iii.

E. B. Tylor, *Early History of Mankind*, (1878), pp. 222 *et seq.*

E. Cartailhac, *L'âge de pierre dans les souvenirs et superstitions*, (1877).

E. Stevens, *Some Account of the Blackmore Museum*, Pt. II (1869), pp. 219 *et seq.*

HENRY BALFOUR.<sup>1</sup>

<sup>1</sup> Plates illustrating to scale twenty-three of the specimens exhibited when the above paper was read to the Society will appear in the next number of *Folk-Lore*.



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Concerning Thunderbolts (Continued)

Author(s): Henry Balfour

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## CONCERNING THUNDERBOLTS.

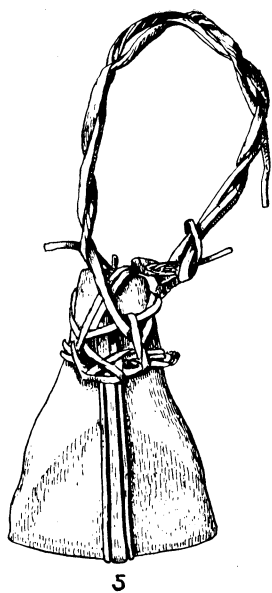
(Continued from p. 49 *antea*).

THE specimens here figured in Plates I and II were exhibited at the Society's meeting on March 20th, 1929, in illustration of a paper "Concerning Thunderbolts" by Henry Balfour; they are selected from the series of "thunderbolts" in the Pitt-Rivers Museum at Oxford. It was not possible to prepare the drawings in time for publication with the paper. The scale of the drawings, as reproduced, is slightly more than one-half size.

Fig. 1—Neolithic celt of light brown stone, surface ground all over. **Perugia, Italy.** Collected by D. Randall-Maciver, 1899. The small perforation at the top is considerably more recent than the fashioning of the celt, as judged by the absence of patination in the hole, which, however, from its 'hour-glass' shape suggests stone-age drilling. Since this small hole could only be used for suspension, it is probable that this celt was preserved in later times as a "thunderbolt" (*folgore* or *pietra del fulmine*).

Fig. 2—Very small ground celt of hard, dark stone. **Perugia, Italy.** From Dr. G. Bellucci's collection. This tiny celt appears too small for practical use. The perforation, drilled from both surfaces after the stone-age fashion, is only suitable for suspension. This celt was kept by peasants as a "thunderbolt," *folgore*, and was carried as a protection against lightning.

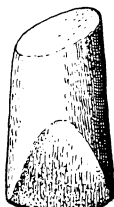




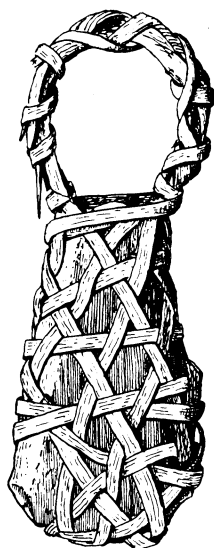
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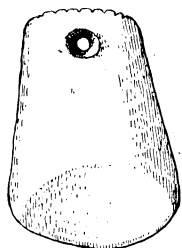
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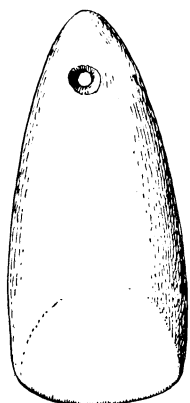
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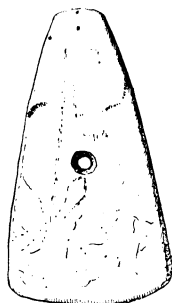
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Fig. 3—Neolithic celt of pale buff stone of great hardness ; surface ground all over. **Japan.** From A. Montgomery Bell's collection. The small central perforation has been made with a metal drill, and is only useful for suspension. Such celts are regarded in Japan as "thunderbolts," *raifu*, and are valued accordingly.

Fig. 4—Ground celt of hard, slaty stone, with blunted cutting-edge and with decorative notching along the top. **Pennsylvania, U.S.A.** Pitt-Rivers collection. The small hole for suspension has evidently been drilled with a stone borer, and suggests that similar ideas as to the nature of such celts became prevalent in N. America, and that the celts were preserved as amulets, though possibly by European settlers rather than by the natives.

Fig. 5—Stone celt, slightly tanged and ground all over ; mounted with a canework loop for suspension. Preserved as a 'thunderbolt' by **Konyak Nagas, of Lasa (Borduria), Naga Hills, Assam.** Collected by C. R. Pawsey, I.C.S., 1925. The belief that stone celts are "thunderbolts" is widespread in the Naga Hills (see J. H. Hutton, *The Sema Nagas*, p. 256 ; *The Angami Nagas*, p. 402 ; J. P. Mills, *The Ao Nagas*, p. 305 ; Barron, *Journ. of the Anthropol. Inst.*, vol. i (1872), p. lxii). Some of the Naga tribes regard them as luck-bringing ; the Lhotas, on the other hand, usually will not touch them.

Fig. 6—Stone celt encased in cane-work and fitted with a suspending-loop. Same *data* as the last.

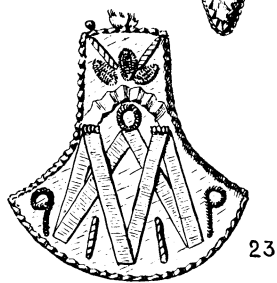
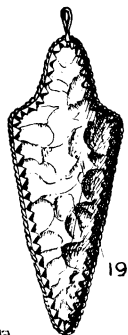
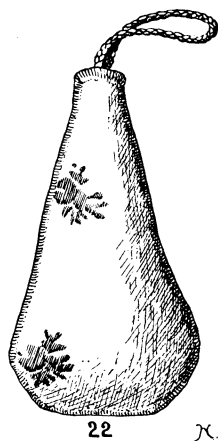
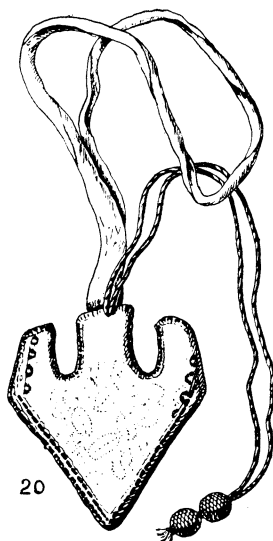
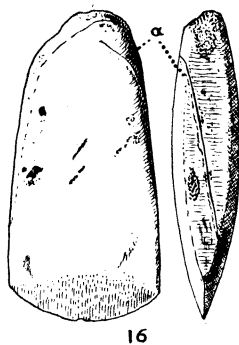
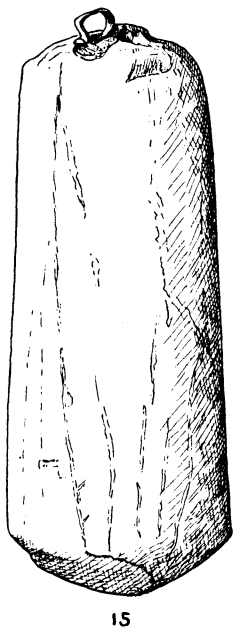
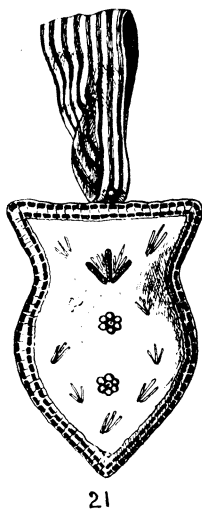
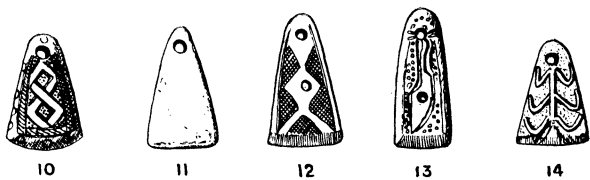
Fig. 7—Small ground stone celt. **Ejura, Ashanti.** Collected by R. S. Rattray, 1912. The edge of this has been ground and re-ground until the celt is only  $1\frac{1}{8}$  inches long and quite unsuited to ordinary use. Celts in Ashanti are believed to be "thunderbolts" and are called *nyame akuma* (i.e. "god-axes"). Powder is scraped off them for use as 'medicine.' (See Lubbock, *Journ. Anthropol. Inst.*,

vol. i (1872), p. xcv. ; Burton, *Ibid.*, vol. xii (1883), p. 450 ; Balfour, *Journ. of the African Society*, 1912, pp. 11 *et seq* ; Rattray, *Ashanti*, pp. 322 *et seq* ; Wild, *Gold Coast Review*, vol. iii (1927), pp. 157 *et seq.*

Fig. 8—Similar small stone celt, *nyame akuma*. **Tarkwa, Ashanti.** Collected by R. P. Wild, 1921. The butt-end of this has been recently ground down diagonally to make powder for medicinal use, in accordance with the belief in the healing properties of "thunderbolts."

Fig. 9—Almond-shaped ground stone celt,  $4\frac{1}{2}$  inches long, partly encased in cotton-cloth and with cowrie shells affixed. The cloth extends  $19\frac{1}{2}$  inches beyond the top of the celt, as a long, wide flap. A leathern amulet-case is attached. The celt is covered with coagulated blood, and chickens' feathers are adhering to it, from sacrifices made to it. This was a powerful "thunderbolt" *juju* at **Idah, Niger R., Nigeria.** Collected by C. Partidge, jun. and given by him in 1920.

Figs. 10-14—Small bronze pendants in the form of miniature neolithic celts, with perforations for suspension. **Benin, Nigeria.** These appear to have been cast by the *cire perdue* process. 10 is exactly modelled upon the almond-shaped stone celt type with strongly convex surfaces ; the double zigzag design may, perhaps, symbolise lightning. 11 is of flatter shape and undecorated. 12 has flat surfaces and squared margins. 13 has faceted margins and is embellished with a chopper-like design. 14 has the design in relief and the squared lateral margins are transversely grooved. These mimic celts in bronze may, no doubt, be regarded as thunder or lightning symbols, the emblems of the Thunder-god, and as typifying the actual stone celts, which throughout West Africa are recognised as "thunderbolts," "god-axes," etc.



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Fig. 15—Ground stone celt, flat with slightly convex surfaces and squared lateral margins ; fitted with a rough iron staple for suspension. **Perak, Straits Settlements.** Collected by Colonel R. S. Frowd Walker, 1892. The Malays (and also some Sakais and Semangs) do not recognise the stone celts, abundantly found in the region, as being the artefacts of their predecessors, but regard them as "thunder-stones," *batu-lintar*, *batu hali-lintar*, or *batu petir*, and value them for their supposed magical qualities. It has been considered lucky to sharpen *krises* and steel cock-fighting spurs upon them. Powder scraped from these celts is sometimes mixed with water and taken 'medicinally.'

Fig. 16—Ground celt of very hard pale-grey stone. Found by a Naga of **Singratsü, Naga Hills, Assam**, near the Alisopore-Singratsü path. Collected by C. R. Pawsey, I.C.S., 1929. A fine crack in the stone (a), running diagonally across one lateral margin, has a reddish tinge, perhaps due to iron infiltration, and this 'lightning streak' appears to have caused the celt to be regarded as a *live* thunderbolt, in contrast to the usual *spent* examples. As such it was a source of danger to its possessor and events tended to confirm this view (see the text, p. 46). This celt is of a type not indigenous in the Naga Hills. It corresponds closely with celt types found in the North-western area of Burma, whence it probably was derived.

Fig. 17—Portion of a belemnite which was preserved by **Oxfordshire** peasants and was used for medicinal purposes. Powder was scraped from it (hence the faceted surface) and was administered in water to children suffering from 'white mouth,' an eruptive disease of the lips. This has been a common practice in the county up to the present day, belemnites being popularly regarded as "thunderbolts" possessing magical therapeutic qualities (see the text, p. 39).

Fig. 18—Tanged flint arrowhead, mounted with a ring-bearing metal cap for suspending as a pendant. **Central Italy.** Neolithic arrowheads are popularly called *pietre del fulmine* (or, more simply *fulmini*, or *folgori*) and are believed to have descended with lightning-flashes. They are valued as a protection against lightning, and also against sickness, witchcraft and other ills.

Fig. 19—Large flint arrowhead, mounted in silver, with suspension-ring. **Aquila, Abruzzi, Italy.** From the collection of Dr. G. Bellucci. Same data as the last [see Bellucci, *Amuleti Italiani* (1898), *Gli amuleti* (1908), and *La grandine nell' Umbria*; also J. Evans, *Ancient Stone Implements* (1897), chap. 16].

Figs. 20-23—Silk amulets having the shape of prehistoric implements. **Eastern Catalonia, Spain, c. 1650 A.D.** From Sir Charles Dawson's collection. One of these, Fig. 20, is a replica of a tanged-and-barbed neolithic arrowhead. A second, Fig. 21, has the form of a stone arrowhead with lateral basal notches, a type rare in Europe though very common in North America. A third, Fig. 22, is in the shape of a neolithic almond-shaped celt. The fourth, Fig. 23, which is covered with tinsel *appliquée* decoration, is evidently modelled upon a flat bronze celt with expanded cutting-edge. These silk amulets, padded out and variously decorated, would appear to indicate a further stage in the employment of "thunderbolts" as amulets or talismans, at which the actual prehistoric implements have given place to more or less conventional representations of them (compare Figs. 10-14).

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